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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,368	05/09/2005	Jun Ogura	05274/LH	2923

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EXAMINER	
CROW, ROBERT THOMAS	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,368	OGURA ET AL.	
	Examiner	Art Unit	
	Robert T. Crow	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *14 and 15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,16 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I in the reply filed on 5 February 2007 is acknowledged.

Claims 14 and 15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5 November 2007.

Claims 1-13 and 16-17 are under prosecution.

Request for Corrected Filing Receipt

2. The Requests for Corrected Filing Receipt received 24 October 2005 is acknowledged. Infineon Casio Computer Co.,Ltd., is listed as the Assignee.

Information Disclosure Statement

3. The Information Disclosure Statement filed 9 May 2005 is acknowledged. However, only the Abstract of Document JP 09-023900 is being considered because an English language translation of the remainder of the document has not been provided.

Claim Objections

4. Claims 1-3 and 5-10 are objected to because of the following informalities, all of which appear to be typographical and/or grammatical errors:

A. Claims 1 and 9, for the recitations "a plurality types of DNA probe" and "each including nucleotide sequence" in lines 3-4 of each of claims 1 and 9.

B. Claim 2, for the recitation "probe are fixed" in line 5 of the claim.

C. Claim 3, for the recitation "each of the DNA probe is fixed" in line 5 of the claim,

D. Claims 5-8 and 10, for the recitations "a plurality types of DNA probe" and "which include nucleotide sequence" in lines 5-6 of claim 5, in lines 6-7 of claim 6, in lines 9-10 of claim 7, in lines 10-11 of claim 8, and in lines 12-13 of claim 10.

E. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2-6, 8, 10-13, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2 and 4 are indefinite in claim 2, which recites the limitation "the DNA probe" in line 5 of the claim, because "the DNA probe" lacks antecedent basis in "a plurality types of DNA probe" in claim 1. It is suggested the claim be amended to reflect proper antecedent basis.

Claim 3 is indefinite in the recitation "the DNA probe" in line 5 of the claim because "the DNA probe" lacks antecedent basis in "a plurality types of DNA probe" in claim 1. It is suggested the claim be amended to reflect proper antecedent basis.

Claim 5 is indefinite in the recitation "an excited light absorbing layer" in line 3 and at the end of the claim because it is unclear if it is the layer that is excited.

Claim 6 is indefinite in the recitation "[1/cm3]" in line 5 of claim 6. The recited unit "1/cm3" is indefinite because the unit contains no amount related to electrical units; i.e., charges, number of electrons, coulombs, etc. In addition, the unit is unclear because it is unclear whether "1" is the number one, and the density is therefore unitless, or if the "1" is a lower case letter "L" representing "liters" or some unit of charge measurement. Thus, in its current configuration, because the quantities that define the unit are unclear, the unit encompasses virtually any amount of charge density. It is suggested the claim be amended to clarify the exact units of charge density.

Claim 8 is indefinite in the recitation " and include a bottom gate electrode 21" in line 5 of the claim because it is unclear how "21" is a structural limitation of the claimed sensor.

Claim 9 is indefinite in the recitation "for attaching the optical sensor detachably" in lines 6-7 of the claim, which is indefinite because the claim recites no structure to which the sensor is attached. Thus, it is unclear what the sensor is attached to.

Claims 10-13 and 17 are indefinite in claim 10, which recites the limitation "like a plane of light" in 16 of claim 10, which is indefinite because it is unclear what metes and bounds are encompassed by the term "like."

Claims 13 and 17 are indefinite because the claims are almost entirely statements of intended use and do not clearly set forth the **structure** of the claimed **apparatus**. For example, claims 13 and 17 each recite the limitation "wherein the DNA probe is able to bond to an appropriate sample DNA having a fluorescent substrate, the fluorescent substance is excited by the phosphor exciting light" in lines 2-4 of each of claims 13 and 17. It is unclear what further structural limitations, if any, are required to bond and excite a DNA sample because the devices of claims 11 and 12, upon which claims 13 and 17 depend, already have DNA probes for binding DNA sample and have light irradiation members for exiting the fluorescent substance. It is suggested the claims be limited to recite only the **structural** limitations of the claimed apparatuses.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3, 5-6, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hollis et al (U.S. Patent No. 5,846,708, issued 8 December 1998).

Regarding claims 1-3 and 6, Hollis et al teach an optical DNA sensor. In a single exemplary embodiment, Hollis et al teach a device comprising a solid imaging device, in the form of an underlying CCD array having an array test sites formed thereon (Figure 15 and column 3, lines 50-55). Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65). The DNA probes are fixed on a transparent layer; namely, a layer of light transmissive material (column 9, lines 15-32), and the CCD array comprises a plurality (i.e., at least 2, Figure 15) of photoelectric elements arranged on a substrate (i.e., claims 2-3; Figure 15). As detailed above under 35 U.S.C. 112, second paragraph, because the quantities that define the unit of charge density are unclear, the unit encompasses virtually any amount of charge density contained within the transparent layer of poly-L-lysine (i.e., claim 6; column 9, lines 15-32).

Regarding claim 5, Hollis et al teach an optical DNA sensor. In a single exemplary embodiment, Hollis et al teach a device comprising a solid imaging device, in the form of an underlying CCD array having an array test sites formed thereon (Figure 15 and column 3, lines 50-55). Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65). The DNA probes are fixed on a layer of material (column 9, lines 15-32).

It is noted that a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also *Upsher-Smith Labs. v. Pamlab, LLC*, 412 F.3d 1319, 1323, 75 USPQ2d 1213, 1215 (Fed. Cir. 2005)(reference disclosing optional inclusion of a particular component teaches compositions that both do and do not contain that component); Celeritas Technologies Ltd. v. Rockwell International Corp., 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998) (The court held that the prior art anticipated the claims even though it taught away from the claimed invention. "The fact that a modem with a single carrier data signal is

shown to be less than optimal does not vitiate the fact that it is disclosed."). Thus, the teaching of Hollis et al that the material to which the DNA probes are fixed may be light transmissive (column 9, lines 15-32) encompasses the alternate embodiment wherein the material is not light transmissive; i.e., absorbs excited light. See MPEP § 2123 [R-5].

Regarding claim 9, Hollis et al teach a DNA reading apparatus. In a single exemplary embodiment, Hollis et al teach a device comprising an optical DNA sensor comprising a solid imaging device; namely, a CCD array having an array test sites formed thereon (Figure 15 and column 3, lines 50-55). Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65). The DNA probes are fixed on the surface of the device, namely, DNA probes are fixed on a layer on the surface of the sensor (column 9, lines 15-32). The apparatus further comprise a driving unit for attaching the optical sensor detachably and for driving the solid imaging device; namely, the apparatus comprises transistors that reversibly disconnect (i.e., attach detachably) each site electrically, thereby driving the solid imaging device (column 20, lines 20-42).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the

examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al (U.S. Patent No. 5,846,708, issued 8 December 1998) in view of Iwasa (U.S. Patent No. 5,381,028, issued 10 January 1995).

Regarding claims 4 and 16, Hollis et al teach the optical DNA sensor of claims 1-3. In a single exemplary embodiment, Hollis et al teach a device comprising a solid imaging device, in the form of an underlying CCD array having an array test sites formed thereon (Figure 15 and column 3, lines 50-55). Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65). The DNA probes are fixed on a transparent layer; namely, a layer of light transmissive material (column 9, lines 15-32), and the CCD array comprises a plurality (i.e., at least 2, Figure 15) of photoelectric elements arranged on a substrate (i.e., claims 2-3; Figure 15). CCD arrays generate electric charges by receiving light.

While Hollis et al further teach semiconductor layers (column 14, lines 40-50) and transistors integrated into the substrate (column 20, lines 20-35), Hollis et al do not explicitly teach filed effect transistor type photoelectric elements.

However, Iwasa teaches MOS field effect transistors having a semiconductor layer (Abstract), which have the added advantage of fewer defects and utility in the miniaturization of devices (column 1, line 65-column 2, line 3).

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the DNA sensor of Hollis et al with the field effect transistors of Iwasa with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a DNA sensor having the added advantage of fewer defects in a miniaturized device as explicitly taught by Iwasa (column 1, line 65-column 2, line 3).

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al (U.S. Patent No. 5,846,708, issued 8 December 1998) in view of Auding et al (U.S. Patent No. 4,889,974, issued 26 December 1989) as evidenced by Mihara (U.S. Patent No. 5,182,662, issued 26 January 1993).

It is noted that while claim 6 has been broadly rejected under 35 U.S.C. 102(b) as described above on pages 5-6, the claim is also obvious as interpreted by the more narrow interpretation outlined below.

Regarding claims 6, Hollis et al teach an optical DNA sensor. In a single exemplary embodiment, Hollis et al teach a device comprising a solid imaging device, in the form of an underlying CCD array having an array test sites formed thereon (Figure 15 and column 3, lines 50-55). Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65).

While Hollis et al teach the DNA probes are fixed on a transparent (i.e., light transmissive) metallic layer (i.e., silicon nitride; column 9, lines 15-32), Hollis et al do not explicitly teach the charge density of the layer.

However, Auding et al teaches SnO2 films having charge densities of $6x10^{20}$ /cm3 (column 3, lines 30-33), which has the added advantage of being having a high degree of transparency and are free from scattering, reams, and cracks (column 2, line 59-column 3, line 5).

It is noted that the courts have stated where the claimed ranges "overlap or lie inside the ranged disclosed by the prior art" and even when the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have similar properties, a *prima facie* case of obviousness exists (see *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); *Titanium Metals Corp. of America v. Banner*, 778 F2d 775. 227 USPQ 773 (Fed. Cir. 1985) (see MPEP 2144.05.01). Therefore, the claimed range of less than or equal to $1x10^{20}$ /cm3 is an obvious variant of the $6x10^{20}$ /cm3 of Auding et al (column 3, lines 30-33).

Mihara defines SnO2 as being transparent (column 3, lines 15-20), and is relied upon solely as evidence of the transparency of SnO2.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the DNA sensor of Hollis et al with the SnO2 layer of Auding et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a DNA sensor having the added advantage of a high degree of transparency and freedom from scattering, reams, and cracks as explicitly taught by Auding et al (column 2, line 59-column 3, line 5).

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al (U.S. Patent No. 5,846,708, issued 8 December 1998) in view of Bogart et al (U.S. Patent No. 5,468,606, issued 21 November 1995).

Regarding claim 7, Hollis et al teach an optical DNA sensor. In a single exemplary embodiment, Hollis et al teach a device comprising a solid imaging device, in the form of an underlying CCD array having an array test sites formed thereon (Figure 15 and column 3, lines 50-55). Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65). The DNA probes are fixed on a dielectric multilayered film; namely, a dielectric layer of material followed by a layer of aluminum oxide are laminated on the substrate (column 9, lines 15-32), wherein aluminum oxide is also dielectric.

Hollis et al also teach optical detection of the phosphor ethidium bromide bound to DNA (column 9, lines 1-10). Hollis et al do not teach the layers of the films are one fourth of a wavelength of the light.

However, Bogart et al teach the formation of multi-layer stacks, wherein the thicknesses are one quarter wavelength of the light, which has added advantage of allowing attenuation of the wavelength of a specific detection color (column 19, lines 20-30 and column 21, lines 1-5).

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the multilayered DNA sensor of Hollis et al with the layers of quarter wavelength thicknesses as taught by Bogart et al with a reasonable expectation of

success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a DNA sensor having the added advantage of allowing attenuation of the specific wavelength of the detection color as explicitly taught by Bogart et al (column 19, lines 20-30 and column 21, lines 1-5).

14. Claim 8 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al (U.S. Patent No. 5,846,708, issued 8 December 1998) in view of Hawkins et al (U.S. Patent No. 4,746,622, issued 24 May 1988).

Regarding claims 8, Hollis et al teach an optical DNA sensor. In a single exemplary embodiment, Hollis et al teach a solid imaging device in the form of a CCD array, which comprises a plurality of photoelectric elements arranged apart from each other (i.e., Figure 15). The elements are on substrate that is transparent (column 10, lines 5-6), and has a bottom gate electrode having a shading property; namely, gate electrodes of tungsten (column 9, lines 15-65), which has a shading property because it is not entirely transparent. Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65). The DNA probes are fixed on a dielectric multilayered film; namely, a layer of material and an upper protective layer of silicon nitride are on the substrate, wherein the silicon nitride is transparent and has the probes thereon (column 9, lines 15-32).

Hollis do not teach the CCD wherein the layer is a light sensitive semiconductor layer or a CCD having a top gate electrode.

However, Hawkins et al teach a CCD having a light sensitive semiconductor layer; namely, a layer of amorphous silicon (column 14, lines 15-31), as well as two sets of gate electrodes, wherein the second set of gate electrodes is on the top of the CCD and is made of polycrystalline silicon (column 10, lines 48-62), which is transparent, and thus light-transmissive. Hawkins et al also teach the CCD configuration has the added advantage of simpler manufacturing techniques and materials (column 7, lines 25-40).

It would therefore have been obvious to a person or ordinary skill in the art at the time the claimed invention was made to have modified the sensor comprising a CCD array of Hollis et al with the CCD array having a light sensitive semiconductor layer and a top gate electrode as taught by Hawkins et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a DNA sensor having the added advantage of having a solid state imaging device that is manufactured by using simple techniques and materials as explicitly taught by Hawkins et al (column 7, lines 25-40).

15. Claims 10-13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al (U.S. Patent No. 5,846,708, issued 8 December 1998) in view of Hawkins et al (U.S. Patent No. 4,746,622, issued 24 May 1988) and further in view of McGall et al (U.S. Patent No. 5,843,655, issued 1 December 1998).

Regarding claims 10-13 and 17, Hollis et al teach a DNA reading apparatus. In a single exemplary embodiment, Hollis et al teach a DNA sensor comprising a solid imaging device in the form of a CCD array, which comprises a plurality of photoelectric elements arranged apart from each other (i.e., Figure 15). The elements are on substrate that is transparent (column 10, lines 5-6), and has a bottom gate electrode having a shading property; namely, gate electrodes of tungsten (column 9, lines 15-65), which has a shading property because it is not entirely transparent. Each test site of the array has DNA probes fixed (i.e., attached) thereon (column 4, lines 25-65). The DNA probes are fixed on a dielectric multilayered film; namely, a layer of material and an upper protective layer of silicon nitride are on the substrate, wherein the silicon nitride is transparent and has the probes thereon (column 9, lines 15-32).

Hollis do not teach the CCD wherein the layer is a light sensitive semiconductor layer or a CCD having a top gate electrode.

However, Hawkins et al teach a CCD having a light sensitive semiconductor layer; namely, a layer of amorphous silicon (column 14, lines 15-31), as well as two sets of gate electrodes, wherein the

second set of gate electrodes is on the top of the CCD and is made of polycrystalline silicon (column 10, lines 48-62), which is transparent, and thus light-transmissive. Hawkins et al also teach the CCD configuration has the added advantage of simpler manufacturing techniques and materials (column 7, lines 25-40).

It would therefore have been obvious to a person or ordinary skill in the art at the time the claimed invention was made to have modified the sensor comprising a CCD array of Hollis et al with the CCD array having a light sensitive semiconductor layer and a top gate electrode as taught by Hawkins et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a DNA sensor having the added advantage of having a solid state imaging device that is manufactured by using simple techniques and materials as explicitly taught by Hawkins et al (column 7, lines 25-40).

Hollis et al further teach the sensor is part of a DNA reading apparatus; namely, the solid imaging device is irradiated by a light source (column 8, line 57-column 9, line 15). However, neither Hollis et al nor Hawkins et al teach a specific light irradiation member.

However, McGall et al teach a DNA reading apparatus comprising an array of DNA probes in the form of oligonucleotides (Figure 12) further comprising a solid state detector in the form of a CCD built into a wafer of the oligonucleotide array (column 12, lines 25-45). The apparatus further comprises an excitation source, which is a light irradiation member, disposed below the sensor (i.e., claim 11). McGall teach the apparatus having this arrangement of parts has the added advantage of allowing two-dimensional imaging of the DNA sensor (i.e., oligonucleotide array; column 12, lines 1-10).

It is noted the courts have held that "while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function." *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). In addition, "[A]pparatus claims cover what a device *is*, not what a device *does*." *Hewlett-Packard Co. v. Bausch &Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in

original). Therefore, the various uses recited in claims 12-13 and 17 (e.g., irradiating a phosphor [i.e., claim 12] or exciting a fluorescent substance [i.e., claims 13 and 17]) fail to define additional structural elements to the device of claim 11. Because the prior art teaches the structural elements of the claims, claims 12 and 13-17 are also obvious over the prior art. See MPEP § 2114.

It would therefore have been obvious to a person or ordinary skill in the art at the time the claimed invention was made to have modified the apparatus of Hollis et al in view of Hawkins et al with the light irradiation member underneath the sensor as taught by McGall et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a DNA sensor having the added advantage of allowing two-dimensional imaging of the DNA sensor taught by McGall et al (column 12, lines 1-10).

Conclusion

16. No claim is allowed.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571) 272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert T. Crow
Examiner
Art Unit 1634

RAM R. SHUKLA, PH.D.
SUPERVISORY PATENT EXAMINER